REMARKS

Claims 14, 17, 18, 20 and 21 have been amended so that the same limitations are set forth therein as are set forth in claim 1.

Applicant confirms the election of the invention defined by claims 1-13 and 17-22 and traverses the restriction requirement between claims 1-13, 17-22 vis a vis claims 14-16. The invention defined by the claims of Group I, i.e., claims 1-13 and 17-22, do not define inventions which are separate and distinct from the invention of claims 14-16. This is true even though the method of some of the claims of Group I can be performed by hand. It has been consistently held that it is obvious to perform a method by a machine if it is known to perform the same method by hand. Consequently, the difference between the claims of Groups I and II does not define patentable subject matter, at least from a broad standpoint. Consequently, the restriction requirement is incorrect and the Examiner is urged to consider all the claims in the present application.

Applicants traverse the rejection of claims 1-13 and 17-22 as being obvious as a result of Chen et al., U.S. Patent 5,807,789, in view of Howald et al., WO 00/58992; applicants note the Howald et al. reference is substantially the same as Howald et al., U.S. Patent 6,265,831.

The Examiner has mischaracterized the Chen et al. reference by stating the RF power is gradually changed. Chen et al. specifically indicates the power change is in steps, and is not gradual. As pointed out in the first three paragraphs on page 4 of the present application, Chen et al. discloses a first step, which lasts for eight seconds, and during which the power supplied to a plasma excitation reactance is 800 watts. At the beginning of a second eight second step, the power is suddenly reduced from 800 watts to 750 watts. At the beginning of a third step, which lasts for 46 seconds, supplied power is suddenly further reduced to 650 watts.

As applicants point out on page 4 of the present application, the foregoing Chen et al. process suffers from similar problems to the problems associated with adding dilutants. The problems arise because the Chen et al. sudden power changes frequently do not enable the corners to be rounded to the desired extent. By gradually changing the power, applicants are able to achieve much better control than the steps which Chen et al. employs. To emphasize the point, claims 23-28 have been added. Each of claims 23-25 indicates there are substantially continuous and gradual variations in power supplied to the plasma, while claims 26-28 indicate the substantially continuous and gradual variations of the power supply to the plasma result from steps in the range of 1 milliwatt to less than 5 percent of the maximum power that can be

supplied to the plasma and have a duration in the range of 1 millisecond to 1 second; see page 13, lines 6-18 of the application as filed. Claims 12 and 13, which include similar limitations, were not discussed in the Office Action.

The Examiner admits Chen et al. fails to disclose the important features of claims 2, 16 and 18, which require the gradual power change to occur while no change is made in the specie, pressure or flow rate of the gas species. The Examiner relies on the Howald et al. reference for these features. However, such reliance is completely contrary to the Chen et al. disclosure because Chen et al. believed it was necessary to change these parameters to achieve the rounded corners. The Chen et al. reference makes it clear that Chen et al. were of the opinion that it was necessary to obtain the desired rounded corners by operating at different pressures, and by changing the gas species flow rate. Because the changes the Examiner proposes fly in the face of the Chen et al. disclosure, the changes the Examiner suggests would not have been made by one of ordinary skill in the art upon reading the Chen et al. patent.

A complete reading of the Chen et al. patent clearly indicates Chen et al. thought it was necessary for the process parameters to change. For example, in the Summary of the Invention portion of the Chen et al. patent, the "second set of process parameters" is indicated as including reduced power and increased

process pressure, while the third set of process parameters is identified as a further reduction in RF power and further increase in process pressure. The Chen et al. patent states these steps enable a shallow trench having round trench top corners and round trench top bottoms to be obtained; see column 2, lines 18-33. Also, column 4, lines 19-22 indicate that in the three-step etching process, the process pressure and RF power are varied substantially to cause the shallow trenches with round corners to be obtained. Hence, the Examiner's proposals to modify Chen et al. as a result of Howald et al. are contrary to the Chen et al. disclosure.

Based on the foregoing, allowance of all pending claims is in order and respectfully requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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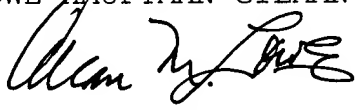

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MARKED UP VERSION SHOWING CHANGES

IN THE CLAIMS:

Please amend claims 14, 17, 18, 20 and 21 as follows:

14. (Amended) A vacuum plasma processor for processing a workpiece in a vacuum plasma processor chamber wherein a gas species is converted into an AC plasma, the chamber being capable of operating at different pressures while the workpiece is being processed, the gas species being subject to flowing into the chamber at different flow rates while the workpiece is being processed, the processor comprising a reactive element for supplying an electric field to plasma in the chamber, and an electric source for supplying gradually changing amounts of power on a preprogrammed basis to the reactive element.

17. (Amended) A computer program for controlling a computer for controlling processing of a workpiece in a vacuum plasma processor chamber wherein a gas species is converted into an AC plasma, the chamber being capable of operating at different pressures while the workpiece is being processed, the gas species being subject to flowing into the chamber at different flow rates while the workpiece is being processed, the computer program storing [signals]a signal causing [(a) the vacuum chamber to operate at different pressures while the workpiece is being processed, (b) control of the gas species type and the flow rates

thereof into the chamber while the workpiece is being processed, (c)] the amount of AC power applied to the plasma while the workpiece is being processed; the stored signal for the amount of applied AC power causing gradual preprogrammed changes in the amount of AC power supplied to the plasma during processing of the workpiece.

18. (Amended) The program of claim 17 wherein the computer program also stores signals causing (a) the vacuum chamber to operate at different pressures while the workpiece is being processed and (b) control of the gas species type and the flow rates thereof into the chamber while the workpiece is being processed, the stored [signal causes]signals causing the gradual power change to occur while no change is made in (a) the species, (b) the pressure or (c) the flow rate.

20. (Amended) The program of claim [19]18 wherein the stored [signal controls]signals control etchant species supplied to the chamber while the workpiece is being processed and the gradual power transition so as to cause the workpiece to be etched to have a rounded corner.

21. (Amended) The program of claim 20 wherein the stored [signal controls]signals control etchant species supplied to the chamber while the workpiece is being processed and the gradual power transition so as to cause the workpiece to be etched to have a trench wall including the rounded corner.